

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-25. (Cancelled)

26. (Original) A method of forming an electromechanical device comprising the steps of:

fabricating a first beam and an integrated circuit monolithically on a semiconductor substrate using standard semiconductor process flows;

patterning an air cavity above the first beam using a sacrificial material;

fabricating a second beam by performing the steps of:

depositing a first conductive material on the sacrificial material by means of sputtering or evaporation;

patterning a sacrificial mold for a second conductive layer;

electrodepositing a thick second conductive layer over the mold;

removing the sacrificial mold and an excess amount of the second conductive layer underneath the mold;

depositing and patterning a mechanical support layer on top of the device;

patterning and etching the semiconductor substrate from a backside of the substrate; and

releasing the first beam so as to be movable by removing the sacrificial material on top of the first beam.

27. (Original) The method of forming a device as recited in claim 26, wherein the step of depositing the second conductive layer is followed by a step of polishing the conductive layer.

28. (Original) The method of forming a device as recited in claim 26, wherein the steps of depositing the first and second conductive layers are each repeated after a dielectric layer is deposited and patterned over each of the first and second conductive layers.

29. (Original) The method of forming a device as recited in claim 27, wherein the dielectric is a mechanical support layer.

30. (Original) The method of forming a device as recited in claim 26, wherein the substrate is selected from the group of semiconductor materials comprising Si, SiGe and GaAs.

31. (Original) The method of forming a device as recited in claim 28, wherein the mechanical support layer is selected from the group comprising a screen-printed polyimide, a photoimageable polymer, and a dry-etchable polymer.

32. (Original) The method of forming a device as recited in claim 26 further comprising the step of forming a polysilicon heater in the movable beam for heating and thereby actuating the moveable beam.

33. (Original) The method of forming a device as recited in claim 26, wherein the first beam is fabricated from a plurality of conductive layers selected from the group comprising polysilicon, aluminum and copper, and from a plurality of dielectric layers selected from the group comprising doped or undoped silicon dioxide, a form of silicon nitride, or a low-k dielectric.

34. (Original) The method of forming a device as recited in claim 32, wherein the low-k dielectric is selected from the group comprising SiLK, Black Diamond, Nanoglass E, and Zirkon LK.

35. (Original) The method of forming a device as recited in claim 26, wherein the second beam is fabricated from a plurality of conductive layers selected from the group comprising gold, copper, silver, platinum, titanium, tungsten, aluminum, nickel, and alloys thereof.

36. (Original) The method of forming a device as recited in claim 26 wherein, the step of fabricating the first beam includes locating a conductive film at a contact area of the first beam, thereby allowing metal-to-metal contact between the first beam and the second beam.

37. (Original) The method of forming a device as recited in claim 26 wherein, the step of fabricating the first beam includes locating a dielectric film at a contact area of the first beam, thereby allowing metal-to-dielectric contact between the first beam and the second beam.

38. (Original) A method of forming an electromechanical device comprising the steps of:

- fabricating a moveable beam and an integrated circuit on a semiconductor substrate using standard semiconductor process flows;
- patterning an air-gap above the movable beam using a sacrificial material;
- fabricating a fixed beam by:
 - depositing a thick conductive film on the sacrificial material by means of sputtering or evaporation;
 - patterning the conductive film via standard photolithography; and
 - etching the conductive film;
- depositing and patterning a mechanical support layer on top of an area covered by the device;
- patterning and etching the semiconductor substrate from a backside of the substrate; and
- releasing the moveable beam by removing the sacrificial layer placed on top of the moveable beam.

39. (Original) The method of forming a device as recited in claim 38 further comprising the step of forming a polysilicon heater in the movable beam for heating and thereby actuating the moveable beam.

40. (Original) The method of forming a device as recited in claim 38 wherein, the step of fabricating the movable beam includes locating a conductive film at a contact area of the moveable beam, thereby allowing metal-to-metal contact between the movable beam and the fixed beam.

41. (Original) The method of forming a device as recited in claim 38 wherein, the step of fabricating the movable beam includes locating a dielectric film at a contact area of the moveable beam, thereby allowing metal-to-dielectric contact between the movable beam and the fixed beam.

42. (Original) The method of forming a device as recited in claim 38, wherein the mechanical support layer is selected from the group comprising a screen-printed polyimide, a photoimageable polymer, and a dry-etchable polymers.